

ON THE OCCURRENCE OF *PUPISOMA* IN SOUTH AFRICA.

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Read 12th January, 1912.

THROUGH the generosity of Mr. J. H. Ponsonby in placing at my disposal for study and comparison every specimen of *Pupisoma* in his collection, I have been enabled to identify two representatives of the genus in South Africa; and through the kindness of Mr. H. Suter and Dr. H. A. Pilsbry in checking and confirming my tentative conclusions, I am able to publish the results of my investigation.

1. *PUPISOMA ORCULA* (Bens.).<sup>1</sup>

Originally described from India, this species is widely distributed through South Africa, specimens having been examined by me from Port Elizabeth (Crawford, per Ponsonby), Grahamstown (Farquhar), Pretoria (Connolly), Victoria Falls, Zambesi (Warren and Connolly), and the following localities in Natal: Richmond (Wakefield and Cooper), Karkloof (Taynton and Burnup), Maritzburg, Edendale, Dargle, and Ntimbankulu, Mid-Illovo (Burnup).

Under a strong lens fine, undulating, spiral striæ may be seen in the spaces between the oblique costulate growth-lines, especially on the base, a feature not recorded in Benson's original description. This is not confined to the South African specimens, but has also been observed in the examples from India, Java, and Japan that I have examined.

In Natal the shells are found on the trunks, branches, and leaves of *Cussonia* and other native shrubs and trees in woods, as well as on orange- and apple-trees in orchards. Mr. Wakefield, of Richmond, attributes to these snails a beneficial influence in the matter of clearing orange-trees of scale, but I have not been able to obtain further confirmative evidence on the subject. Sometimes a distinct varix, showing a former resting-place, is formed upon the shell.

It is difficult to decide in these minute, thin-lipped shells when maturity has been reached; therefore to record average dimensions of the shells measured would be misleading. I have, however, chosen a few shells which seem mature, and hereunder give their dimensions—

Height.	Width.	$\frac{\text{Height}}{\text{Width}} \times 100.$
mm.	mm.	
1·57	1·75	90
1·62	1·88	86
2·00	1·74	115
2·18	1·94	112

<sup>1</sup> *Helix orcula*, Bens., Ann. Mag. Nat. Hist., ser. II, vol. vi, p. 251, 1850. Reeve, Conch. Icon., vol. vii, *Helix*, pl. 174, fig. 1176, 1853. *Pupa* (*Pupisoma*) *orcula*, G. Nevill, Handlist Moll. Ind. Mus., i, p. 192, 1878. *Pupisoma orcula*, Pilsbry, Man. Conch., ser. II, vol. ix, p. 52, 1894; Hirase, Conch. Mag., vol. iii, pl. ix, figs. 30, 31, 1909.

The ratio of height to width shows, as is substantiated by further measurements taken but not recorded here, that in the later stages of development the shells are proportionately high for their width.

A remarkable shell, much larger than any other that I have examined, local or foreign, collected by Major Connolly at Victoria Falls, measures 2.8 mm. high and 2.5 mm. wide, the ratio of height to width being 112 to 100. It has  $4\frac{1}{2}$  whorls.

Both this species and the following are ovoviviparous, many of the specimens examined containing one young mollusc furnished with a shell, and some few containing two, one much larger than the other.

Mr. H. Suter and Dr. H. A. Pilsbry concur in the determination of this form.

## 2. PUPISOMA JAPONICUM, Pils.<sup>1</sup>

I have not received specimens of this species from any of my South African correspondents, but have myself collected it at Maritzburg, Edendale, Karkloof, and Ntimbankulu, Natal; commensal with *P. oreula* on indigenous trees and shrubs. The following are some of the measurements that I have taken of apparently mature specimens:—

Height.	Width.	$\frac{\text{Height}}{\text{Width}} \times 100.$
mm.	mm.	
1.22	1.16	105
1.32	1.24	106
1.35	1.32	102
1.41	1.37	103

By these figures it will be seen that this species is much truer to a normal proportion than *P. oreula*, the ratio of height to width remaining nearly constant.

In this species I cannot find any trace of the minute spiral striæ to be seen in *P. oreula*, Bens., *pulvisculum*, Issel, and other species.

As compared with *P. oreula*, *Japonicum* is of a much more regular form, strongly suggesting *Trigonephrus globulus* (Müll.) in miniature. By this difference in form, by the umbilical perforation being open instead of nearly covered by the triangular reflection of the columellar lip, by the absence of the revolving striæ, and by the much smaller size, this species is easily separable from *P. oreula*.

I have submitted examples to Dr. H. A. Pilsbry, who confirms the above determination.

<sup>1</sup> *Nautilus*, vol. xvi, p. 21, 1902.